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**REMARKS**

Claims 12, 24 and 57 are amended herein. Upon entry of this amendment, claims 12, 14-17, 24-29, 31-36, 38-41, 50-51 and 53-63 will be pending. Applicants acknowledge that claims 18, 30, 37 and 42-49 are withdrawn from consideration.

Claims 12, 14-17, 24-29, 31-36, 38-41, 50-51 and 53-63 are incorrectly listed as being subject to restriction and/or election. Applicants request correction of the claim listing.

Entry of this amendment is proper because the amendment places the application in condition for allowance and does not present substantial new issues requiring further consideration.

**Acknowledgment of Allowed/Allowable Claims**

Applicants acknowledge that claims 14, 16, 25-28, 33-35 and 39-40 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

**Telephone Interview Summary**

The undersigned thanks the Examiner for the telephone interview of October 21, 2003. The claim rejections were discussed, especially with respect to the Meuzelaar and Andresen references. The undersigned emphasized that the rejections over Meuzelaar and Andresen were unclear because features of the references were not correlated to the claimed features. Further, the references did not appear to show the claimed features of each independent claim. The Examiner stated it was not possible to prepare a clarification of the rejections, and asked instead that applicants prepare a request for reconsideration. No agreement regarding allowability of additional claims was reached.

**Objection to the Drawings**

Figures 4-6 are amended in response to the objection to the drawings. In more detail, Figures 4 and 5 are amended to show that the heater 156 is inside the probe. Antecedent basis for the amendment of Figures 4 and 5 is provided at page 10, lines 7-

10 and page 11, lines 24-25 in the substitute specification. Figure 6 is amended to show heaters, and basis is provided at page 11, lines 32 through page 12, line 1 in the substitute specification. The heaters in Figure 6 are given reference number 223 pursuant to the specification amendment herein. No new matter is added by the amendment.

**Amendment to the Specification**

The paragraph beginning at page 11, line 26 of the substitute specification is amended to add a reference number (223) with respect to the heaters of the third embodiment (Figure 6). No new matter is added by the amendment.

**Rejection of Claims 26-28, 34, 35, 52-57 under 35 U.S.C. § 112**

Claims 31, 53, 54 and 58-63 are rejected under § 112, first paragraph for failing to comply with the written description requirement.

Claim 31 is rejected on the grounds that there is no support for "an outlet positioned at an exterior of the tip" and "an opening separate from the sampling passage." Applicants traverse the rejection because embodiments of the claimed outlet and opening are shown in Figure 4 and described in the substitute specification at page 9, lines 21-23 (an outlet) and page 16, lines 4-7 (openings such as grooves (262)). The Examiner also asks whether the opening is different from the recess. The opening (such as grooves (262)) is shown to be different than the recess (118) in Figure 4 and is described as being different at page 15, lines 4-7. Regarding the general function of the claimed opening, the description at page 14, lines 26-31 may also be helpful to the Examiner. Accordingly, applicants request the rejection be withdrawn.

Claims 53 and 54 are rejected on the grounds that there is no support for "a cover covering the inner body." Applicants are unclear why claim 53 is included in the rejection because claim 53 does not recite a cover. In any event, Figure 5 shows an embodiment of the claimed cover. As also described at page 10,

lines 18-20, cover 180 captures the inner body or plug 174. Accordingly, the rejection of claims 53-54 should be withdrawn.

Claims 58-63 are rejected because the claimed heater(s) inside the probe is not shown in the drawings. Applicants submit the rejection is now overcome with above-described drawing amendment to Figures 4-6. Accordingly, the rejection of claims 58-63 should be withdrawn.

Claim 57 and its dependent claim 58 are rejected under § 112, second paragraph, because there is no antecedent basis for "the body" in claim 57. Recitation of "body" was a typographical error, and therefore claim 57 is amended to recite "probe" instead of "body." Antecedent basis for "probe" is found in line 1 of claim 57.

Rejections Under 35 U.S.C. § 102

**Rejection over Andresen**

Referring to Section 2 of the rejection, claim 12 is rejected as anticipated by U.S. Pat. No. 4,705,616 (Andresen). Claim 12 is directed to a sampling probe for delivering a reactant to a substance deposited on a substrate to form a reaction product and for transporting the reaction product to a product analyzer for analysis. The probe comprises, in pertinent part:

- a) an inner body and
- b) an outer body having an inner cavity sized and shaped for receiving the inner body,
- c) a tip for engaging the substrate, and
- d) **a resiliently compliant element connecting the tip to the inner body and permitting the tip to move relative to the inner body,**
- e) the tip having a recess sized and shaped for receiving at least a portion of the reaction product,
- f) a reactant delivery passage extending through the probe to an outlet at the tip, and
- g) a reaction product sampling passage extending from the recess.

Claim 12 is patentable over Andresen because the reference fails to show or suggest a sampling probe including an inner body, a tip and **a resiliently compliant element connecting the tip and the inner body.**

Andresen discloses an electrophoresis-mass spectrometry probe including a casing 50 having a central open section 54 for receiving a terminal block 56 and a threaded opening 55 for receiving a threaded plug 57 (Figure 6). The plug includes an opening 71 with countersink 70 for receiving a nozzle 73. A screen 74 and two washers 75 are disposed between the plug 57 and the terminal block.

The Examiner asserts that Andresen's plug 57 and screen 74 are resiliently compliant elements connecting the tip to the inner body. However, the rejection fails to specify what portion

of Andresen is the tip or the inner body. Indeed, Andresen fails to show the claimed construction. Regardless of which elements of Andresen are interpreted to be the tip or the inner body, Andresen fails to show the claimed resiliently compliant element connecting the tip to the inner body and permitting movement therebetween. As best understood, the Examiner's position is that the end of the casing adjacent the reference number 55 is equivalent to the claimed "tip". However, a review of Figure 6 and the specification shows there is no resiliently compliant element connecting the end of the casing to any other element, much less a resiliently compliant element as claimed by applicants. If the plug 57 is interpreted to be the claimed tip, there is still no resiliently compliant element connecting the plug to any "inner body" as claimed. Rather, the plug is connected to the casing via threads. Such connection is not analogous to the claimed resiliently compliant element. Accordingly, the rejection of claim 12 is in error and should be withdrawn. Dependent claims 15 and 17 are submitted as patentable over Andresen for the same reasons as claim 12.

Amended claim 24 recites a probe comprising, in pertinent part, a tip, a body and a resiliently compliant element connecting the tip to the body. To the extent claim 24 corresponds to claim 12, claim 24 is submitted as patentable for the same reasons as claim 12. Also, claim 29 depends from claim 24 and is submitted as patentable for the same reasons as claim 24.

#### **Rejection over Meuzelaar**

Skipping over to Section 4 of the rejection, claim 12 is also rejected as anticipated by U.S. Pat. No. 4,408,125 (Meuzelaar). However, Meuzelaar does not show or suggest the claimed reactant delivery passage extending through the probe to an outlet at the tip.

Meuzelaar generally comprises a modular pyrolysis inlet 10 comprising a probe 12, a vacuum housing 18, a pyrolysis chamber housing 20 and a mass spectrometer inlet housing (Figure 1). In

more detail and referring to Figure 2 of Meuzelaar, the probe includes a probe shaft 14 received in a housing 16. (Col. 5 line 66 - col. 6 lines 1-50). A second telescoping member 13 is formed at the end of the probe shaft for receiving a first telescoping member 11. A spring 50 is disposed between the first and second telescoping members for allowing movement of the probe shaft/second telescoping member. A bolt 44 extends through the spring and is fixed to the probe shaft 14 and first telescoping member 11. A wire 82 having the sample thereon is fixed to the bolt via a holder 76 and is disposed to extend into a reaction chamber 80. **Note that the wire 82 is contacted with a prepared sample to be analyzed prior to insertion of the probe into the reaction chamber. (Col. 8, lines 36-56). A minute amount of the prepared sample adheres to the wire and is thereafter heated.** A heating mantle 94 including a filament 96 is disposed around a heated portion of the chamber 80 for heating the sample to pyrolysis temperatures. (Col. 6, lines 51-64). A high frequency coil 92 is also disposed around the chamber 80 for emitting high frequency radio waves to the wire 82. (Col. 7, lines 5-18). In operation, the probe shaft is moved to the right (as shown in Figure 2) to overcome the resistance of spring 50 and thereby cause the wire 82 to move further into the heated portion of the reaction chamber 80. (Col 9, lines 27-48). The pyrolysis products exit through outlet 86 into expansion chamber 102 and thereafter through expansion chamber 102.

As best understood, the Examiner asserts that reaction chamber 80 and the wire 82 of Meuzelaar are equivalent to the claimed reactant delivery passage and the reaction product sampling passage. In fact, **Meuzelaar does not show or suggest the claimed reactant delivery passage extending through the probe to an outlet at the tip. Rather, Meuzelaar shows a wire having a sample adhered thereto within the reaction chamber.** Because the sample is adhered to the wire, Meuzelaar has no need for a reactant delivery passage extending through the probe. Accordingly, the rejection over Meuzelaar is improper.

If the Examiner maintains the rejection over Meuzelaar, applicants respectfully request a more detailed explanation of what portion of Meuzelaar's complicated assembly is equivalent to each element of the claim. As the rejection is best understood, the reaction chamber 80 and the wire 82 are asserted to be equivalent to the claimed reactant delivery passage and the reaction product sampling passage. If this is the Examiner's position, then Meuzelaar does not appear to disclose a tip with a recess sized and shaped for receiving at least a portion of the reaction product. Presumably, the reaction chamber and wire cannot also be the tip because the Examiner took the position that the reaction chamber functions as two other elements (reactant delivery passage and reaction product sampling passage) of the claimed invention. Further, the Examiner has failed to specify what portion of Meuzelaar is the inner body and what portion is the outer body. Clarification or withdrawal of the rejection is respectfully requested.

In reconsidering the rejection, functional recitations such as "for engaging a substrate" and "sized and shaped for receiving a reaction product," must also be considered by the Examiner. The MPEP and the case law make clear that functional limitations must be evaluated and considered, just like any other limitation of the claim, for what the limitation fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. MPEP § 2173.01. Merely dismissing the recitations as "method limitations" is improper.

For all the above reasons, claim 12 is submitted as patentable over Meuzelaar. Dependents claim 17 and 59 are submitted as patentable over Meuzelaar for the same reasons as claim 12.

To the extent claim 24 corresponds to claim 12, claim 24 is submitted as patentable for the same reasons as claim 12. Also, claims 29 and 60 depend from claim 24 and are submitted as patentable for the same reasons as claim 24.



Claim 31 is directed to a sampling probe comprising among other things:

- a) **a recess in the tip** sized and shaped for receiving at least a portion of the reaction product,
- b) a reaction product sampling passage extending from the recess,
- c) a reactant delivery passage extending to **an outlet positioned at an exterior of the tip** for delivering reactant to the substance on the substrate to form the reaction product, and
- d) wherein **the tip includes at least one opening separate from the sampling passage permitting reactants to flow from the exterior of the tip into the recess when the tip contacts the substrate.**

Meuzelaar fails to show or suggest the claimed reactant delivery passage, as discussed above with respect to claim 12. Meuzelaar also fails to disclose the passage extending to an outlet positioned at **an exterior** of the tip. Meuzelaar further fails to show or suggest a tip having at least one opening separate from the sampling passage. Accordingly, claim 31 and its dependent claims 32, 36 and 61 are submitted as patentable over Meuzelaar.

Claim 51 is directed to a sampling probe comprising, among other things,

- a) an outer body having an inner cavity, an inner body positioned in the inner cavity,
- b) **a mixing chamber inside the probe** above an upper end face of the inner body for mixing reactants therein, and
- c) **a plurality of reactant source passages extending through the probe from a plurality of reactant sources to the mixing chamber** for delivering reactants to the mixing chamber.

Meuzelaar does not show or suggest a mixing chamber or a plurality of reactant source passages as claimed. Further, the Examiner has failed to indicate what portion of the Meuzelaar construction is equivalent to the claimed elements. Accordingly,

the rejection of claim 51 and its dependent claims 53 and 63 should be withdrawn.

#### Rejection over Weinberg

Referring to Section 3 of the rejection, claim 38 is rejected as anticipated by Weinberg. Claim 38 is directed to a sampling probe comprising, among other things:

- a) a reactant delivery passage extending to an outlet positioned at the tip for delivering reactant to the substance on the substrate; and
- b) an overflow vent passage positioned in the body to remove excess reactant **before said excess reactant reaches the outlet for optimizing contact time between the reactant and the substance.**

Claim 38 is patentable over Weinberg because the reference fails to show an overflow vent passage positioned in the body to remove excess reactant before said excess reactant reaches the outlet for optimizing contact time between the reactant and the substance.

Weinberg shows an outer passage 908 extending from an annular opening 1004 at the tip of the probe for removing excess reactant. (See Fig. 10.) Weinberg fails to show an overflow vent passage **positioned in the body to remove excess reactant before said excess reactant reaches the outlet.** In Weinberg, any excess reactant would have to flow out through the outlet opening at the tip before it could reach the annular opening 1004. In contrast, applicants' claim is directed to an overflow vent passage in the body which allows for higher reactant flow rates and which removes excess reactant before the excess reactant reaches the outlet. As described at page 13, lines 1-10 and 23-30 of the substitute specification, the overflow vent passage allows the contact time to be controlled substantially by the flow rate through the product sampling passage 240 and the recess volume, thereby enabling optimization of the contact time. Weinberg fails to show the claimed construction and claim 38 is, therefore, submitted as patentable over Weinberg.

Claim 41 depends from claim 38 and is submitted as patentable for the same reasons as claim 38.

Claim 51 is rejected as anticipated by Weinberg. The Examiner states that "[s]ince reactants are delivered through two passages (904, 902), the junction of the two passages (904, 902) is the mixing chamber in which the reactants mingle." The Examiner has misinterpreted Weinberg in this regard. Weinberg discloses that reactant gases are delivered from a single source (inlet conduit 804, see Figs 8-9 and col. 15, lines 56-67) and flow through the passages 904 and 906. Weinberg does not disclose a mixing chamber inside the probe, nor a plurality of reactant source passages extending through the probe to the mixing chamber. In contrast, applicants' construction includes a plurality of reactant source passages (e.g., tubes 138 of Fig. 3) extending to a mixing chamber (e.g., chamber 244 in Fig. 6). Among other advantages, the mixing chamber enables more precise liquid flow rate control, especially at very low flow rates. Accordingly, claim 51 is patentable over Weinberg.

Claims 53-56 depend from claim 51 and are patentable over Weinberg for the same reasons as claim 51.

Claim 54 states that the probe further comprises a cover mounted on the body covering the inner body and forming **an upper recess** between the cover and a lower end face of the inner body, and an aperture extending through the cover to permit reactants to pass through the cover to the substance, **wherein the aperture is offset from the reactant delivery passage in the inner body to promote mixing of the reactants in the upper recess**. Weinberg does not teach or suggest an upper recess or an offset aperture as recited in claim 54. Indeed, the Examiner does not assert that Weinberg shows an offset aperture to promote mixing in an upper recess. Accordingly, claim 54 is patentable for these additional reasons.

Independent claim 57 is directed to a sampling probe comprising, among other things, an **overflow vent passage in fluid**

communication with a mixing chamber and positioned in the body for removing excess reactant from the mixing chamber **before said excess reactant reaches said outlet**. To the extent that claim 57 corresponds to claim 38, it is submitted as patentable for the same reasons as claim 38. Also, claim 57 recites a mixing chamber positioned inside the probe. To the extent claim 57 corresponds to claim 51, it is submitted as patentable for the same reasons as claim 51.

#### **Rejection over Beer**

Referring to Section 5 of the rejection, claim 31 is rejected as anticipated by U.S. Pat. No. 3,607,094 (Beer). The operation of Beer was described in the Remarks section of Amendment D and need not be described in detail again. In summary, Beer does not anticipate claim 31 because the reference does not show a tip including at least one opening separate from the sampling passage permitting reactants to flow from an outlet at an exterior of the tip into the recess when the tip contacts the substrate. Beer does not show an outlet at an exterior of the tip, nor an opening separate from the sampling passage permitting reactants to **flow from the exterior of the tip into the recess when the tip contacts the substrate** as recited in claim 31. An exemplary opening in the tip permitting reactants to flow into the recess is shown in Fig. 4 and is described as "groove 262" at page 15, lines 4-7 of the substitute specification. The groove or opening increases flow under and through the tip when the tip contacts the substrate. In contrast, **Beer's tip is positioned above the tube, not in contact therewith, and Beer's tip does not have an opening separate from the sampling passage permitting reactants to flow into the recess when the tip contacts the substrate**. Accordingly, claim 31 is patentable over Beer for at least these reasons. Claim 50 depending from claim 31 is submitted as patentable for the same reasons as claim 31.

CONCLUSION

In view of the foregoing, allowance of the application is respectfully requested. The undersigned requests a telephone call from the Examiner if this would expedite allowance of the application.

The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment to Deposit Account No. 19-1345 in the name of Senniger, Powers, Leavitt & Roedel.

Respectfully submitted,



Michael G. Munsell, Reg. No. 43,820  
SENNIGER, POWERS, LEAVITT & ROEDEL  
One Metropolitan Square, 16th Floor  
St. Louis, Missouri 63102  
(314) 231-5400

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